5-23-1970

Test 1043: Allis-Chalmers Crop Hustler 175 Diesel

Tractor Museum
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NEBRASKA TRACTOR TEST 1043 – ALLIS-CHALMERS CROP HUSTLER 175 DIESEL

POWER TAKE-OFF PERFORMANCE

	Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—665 rpm)									
	62.47	2000	4.195	0.465	14.89	191	65	76	28.693
Standard Power Take-off Speed (540 rpm)—One Hour									
	54.62	1624	3.624	0.460	15.07	196	65	75	28.930
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS									
	54.95	2070	3.529	0.445	15.57	184	65	76	.....
	0.00	2183	1.070	.....	.....	173	66	76	.....
	28.29	2132	2.152	0.527	13.15	177	67	78	.....
	62.91	2000	4.226	0.465	14.89	196	64	75	.....
	14.35	2161	1.615	0.780	8.89	181	69	82	.....
	41.90	2104	2.767	0.458	15.14	185	69	82	.....
Av	**33.73**	**2108**	**2.560**	**0.526**	**13.18**	**183**	**66**	**78**	**28.703**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Fuel Consumption Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—5th Gear (2nd Hi)											
54.06	4272	4.75	2000	7.81	4.247	0.544	12.73	181	57	69	28.940
75% of Pull at Maximum Power—Ten Hours—5th Gear (2nd Hi)											
43.24	3216	5.04	2087	6.12	3.245	0.520	13.33	170	56	60	28.955
50% of Pull at Maximum Power—Two Hours—5th Gear (2nd Hi)											
30.51	2191	5.22	2121	4.34	2.561	0.582	11.91	.....	67	76	28.865
MAXIMUM POWER WITH BALLAST											
44.81	6407	2.62	2066	14.99	2nd Gear (1st Hi)			170	69	82	28.765
50.55	6016	3.15	1999	12.85	3rd Gear (2nd Low)			174	68	72	28.790
52.22	4826	4.06	1999	9.19	4th Gear (3rd Low)			179	66	70	28.790
55.27	4369	4.74	2000	7.81	5th Gear (2nd Hi)			181	57	69	28.940
54.26	3420	5.95	2001	6.44	6th Gear (3rd Hi)			175	65	69	28.790
53.75	2164	9.31	2002	4.09	7th Gear (4th Low)			172	67	74	28.790
MAXIMUM PULL WITHOUT BALLAST											
48.52	4712	3.86	2017	14.88	4th Gear (3rd Low)			172	58	70	28.980

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—5th Gear (2nd Hi)

Pounds Pull	4369	4522	4676	4700	4661	4477
Horsepower	55.27	51.21	47.04	41.16	35.01	27.74
Crankshaft Speed rpm	2000	1802	1606	1403	1200	987
Miles Per Hour	4.74	4.25	3.77	3.28	2.82	2.32
Slip of Drivers %	7.81	8.33	8.68	9.13	8.79	8.56

TIRES, BALLAST and WEIGHT		**With Ballast**	**Without Ballast**
Rear tires	—No, size, ply & psi	Two 16.9-28; 6; 16	Two 16.9-28; 6; 16
Ballast	—Liquid	660 lb each	None
	Cast iron	570 lb each	None
Front tires	—No, size, ply & psi	Two 6.50-16; 6; 40	Two 6.50-16; 6; 40
Ballast	—Liquid	None	None
	Cast iron	None	None
Height of drawbar		18½ inches	19 inches
Static weight with operator—Rear		6460 lb	4000 lb
	Front	1940 lb	1925 lb
	Total	8400 lb	5925 lb

Department of Agricultural Engineering

Dates of Test: May 26 to June 3, 1970

Manufacturer: ALLIS-CHALMERS MANUFACTURING COMPANY, MILWAUKEE, WISCONSIN

FUEL, OIL and TIME **Fuel** No 2 Diesel **Cetane** 50.8 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8322 **Weight per gallon** 6.928 lb **Oil** SAE 30 **API service classification** MS, DS **To motor** 2.102 gal **Drained from motor** 1.549 gal **Transmission and final-drive lubricant** Allis-Chalmers special lube oil **Total time engine was operated** 52½ hours.

ENGINE **Make** Perkins Diesel **Type** 4 cylinder vertical **Serial No** 36867 **Crankshaft mounted** lengthwise **Rated rpm** 2000 **Bore and stroke** 3.875″ x 5.000″ **Compression ratio** 16 to 1 **Displacement** 235.9 cu in **Cranking system** 12 volt electric **Lubrication** pressure **Air cleaner** dry type with replaceable pleated paper element **Oil filter** full flow replaceable pleated paper cartridge **Fuel filter** one sediment bowl with screen, primary and secondary filters with replaceable elements **Muffler** was used **Cooling medium temperature control** thermostat.

CHASSIS **Type** standard **Serial No** 175-1079D **Tread width** rear 58″ to 82″ front 53″ to 73″ **Wheel base** 95.5″ **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 33″ Vertical distance above roadway 30.6″ Horizontal distance from center of rear wheel tread 0″ to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio plus operator controlled partial range power shifting **Advertised speeds mph** first 2.1 second 3.0 third 3.6 fourth 4.4 fifth 5.1 sixth 6.3 seventh 9.7 eighth 13.7 reverse 2.75 and 4.0 **Clutch** single plate dry disc operated by foot pedal **Brakes** contracting band and disc operated by two foot pedals which can be locked together **Steering** hydrostatic power **Turning radius** (on concrete surface with brake applied) right 122″ left 122″ (on concrete surface without brake) right 138″ left 138″ **Turning space diameter** (on concrete surface with brake applied) right 253″ left 253″ (on concrete surface without brake) right 288″ left 288″ **Power take-off** 540 rpm at 1622 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with the SAE and ASAE test code. First gear was not run as it was necessary to limit the pull in second gear to avoid excessive wheel slippage. Eighth gear was not run as test procedure permits only one travel speed over 8 MPH.

We, the undersigned certify that this is a true and correct report of official Tractor Test 1043.

L. F. LARSEN
Engineer-In-Charge

G. W. STEINBRUEGGE
W. E. SPLINTER
D. E. LANE
Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. W. Ottoson, Director; Lincoln, Nebraska

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of AutomotiveEngineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the belt pulley or the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, ½ of the 85% torque; maximum power. ¼ and ¾ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests.

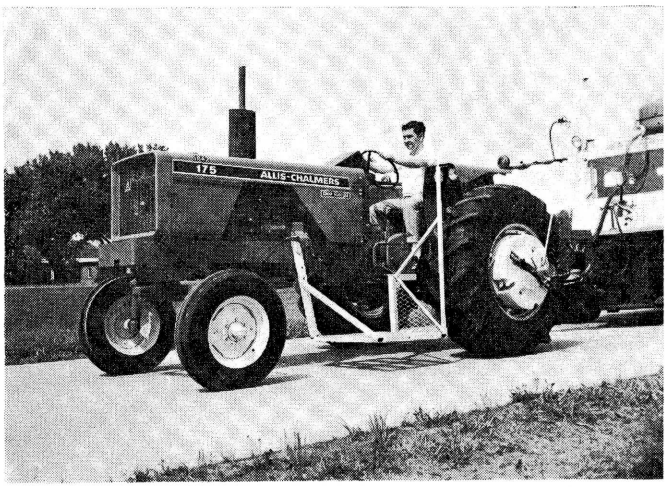
Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; and (3) 50% of the pull at maximum power.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 8 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe-limit for the test course. The manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Pull without Ballast. All added ballast is removed from the tractor. The drawbar pull is determined at slip limits of 15% for pneumatic tires or 7% for steel tracks or lugs. The tractor is operated at the fastest possible travel speed.

Varying Drawbar Pull and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

For additional information about the **Nebraska Tractor Tests** write to the **Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska 68503.**



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